CONTINUOUS IMPROVEMENT PROJECT DATABASE

DIVISION 1 PROJECTS

Project Name	Project Description	Division	Project Year	Contact Name	Contact Number	Project Category
Wireless Link Between Laptop Computer and Traffic Signal	In order to use the laptop computer for programming, preventive maintenance, and troubleshooting traffic signal equipment, the technician has historically had only two options. The first was to remove the laptop computer from the truck exposing it to rain, sand, and other elements that reduced its usable life. The second option was to park the truck in close proximity to the signal cabinet and run a cable from the computer to the traffic signal equipment. This option places the technician, pedestrians, and the motoring public at risk of injury or death. The solution was to use 2.4ghz spread spectrum radio modems that can be compatible with various types of traffic control equipment. As a result of the implementation of the wireless connection, technicians are able to perform the required tasks with the trucks parked in areas that allow the greatest safety for technicians, pedestrians, and the motoring public. An unexpected benefit of the project is increased productivity from technicians who complete the required task using laptop computer.	Division 1 - Operations & Traffic	2009	Leslie Newbern	(336) 315-7080	Safety Improvement
Division One Brine Systems	Problem: Conventional snow/ice control methods yielded unsatisfactory results. Other Divisions were instituting brine operations, and achieving much improved removal of snow/ice from roadways. Division One desired to utilize brine on a Divisionwide basis, but purchase of prefabricated units for a project of this magnitude was deemed unfeasible. Solution: The Division decided to pursue construction of homemade units, based on designs observed in other Divisions. Estimates for the materials were computed, and approval to proceed was obtained. Materials were purchased, and the production and distribution systems were constructed. Results: After the work was completed, the total cost for the project was $197,993.09, a savings of $350,843.30 over prefabricated systems. The Division now has the capability to treat all necessary routes prior to events. This results on enhanced safety for employees, motorists, and enhanced public image for the Department.	Div 1	2008	Win Bridgers	(252)-332-4021	Dollar Savings
Installation of four (4) test piles & PDA on Ocracoke Island	Problem: As a result of bids being received at 675% above the Engineer's estimate and a extremely compressed schedule/deadline it was evident that the Division could not contract the installation of four test piles and the associated PDA testing required. Due to the restrictive time schedule and the necessity of the data provided by the PDA testing, an out of the box solution had to be formulated and quickly implemented. Solution: The Division consulted with the Geotechnical Unit and decided to perform this work with Division forces. Due to the crane size necessitated due to the pile and hammer size the Division had to contract (using a fully operated rental agreement) for an 80-ton track crane. Another rental agreement was utilized to provide a D30-32 Impact Hammer, a D19-42 Impact Hammer, and all required hardware for the diesel hammers. Division personnel requisitioned the 4 concrete piles along with the 4 steel pile tips to be driven on this project. The Division used Bridge Maintenance personnel for the delivery of all materials and the labor necessary to drive the 4 PDAs. The Geotechnical Unit helped in this endeavor by provided expert advice and a contract technician to perform the PDA testing. Results: After all work was completed, the total cost for the project was $157,638.03, a saving of $302,059.97 (when compared to the lowest responsive bid we received of $459,698.00). As a result of this project necessary data was obtained to ensure the replacement of seven bridges along NC 12 was let in time to meet the restrictive closure period (of 75 days during the winter of 2007-08).	Div 1	2008	Sterling Baker	(252)-482-7977	Dollar Savings
Installation of Four Test Piles & PDA on Ocracoke Island	Problem: As a result of bids being received at 675% above the Engineer's estimate and an extremely compressed schedule/deadline it was evident that the Division could not contract the installation of four test piles and the associated PDA testing required. Due to the restrictive time schedule and the necessity of the data provided by the PDA testing, an out of the box solution had to be formulated and quickly implemented. Solution: The Division consulted with the Geotechnical Unit and decided to perform this work with Division forces. A fully operated rental agreement was used for the needed 80-ton track crane. Division personnel acquired the needed concrete piles and steel pipe tips. Bridge Maintenance personnel were use for the delivery of all materials and the labor necessary to drive the 4 PDAs. The Geotechnical Unit provided expert advice and a contract technician to perform the PDA testing.	Operations- Division 1	2007	Sterling Bake	(252) 482-7977	Dollar Savings

Facility/Shop Audit Check	Problem: The safety audit had become a routine checklist that did not provide a means to track trends or provide information needed for decision making and upgrading facilities. OSHA compliance concerns were not given detailed attention and the diversity of equipment shops, maintenance facilities and office environments were not given consideration on the previous form. Comments and suggestions were separate from items being evaluated. Also, the previous form could not effectively highlight training needs. An evaluation tool with greater detail and more precision was needed. Solution: A workable audit tool was needed to provide information to decision-makers, communicate hazards to employees, reduce incidents and improve regulatory compliance. The Facility/Shop Audit Check was developed to address these needs.	Operations - Division 1	2006	Jo Ann White	(252) 482-7977	Communications
Polycarbonate Signal Heads	Traffic signals in Dare county are located in a challenging environment that adds to the difficulties in performing maintenance activities. Challenges such as high winds and salt air degrade most materials if left unprotected or unsecured. Signal heads which house the red, yellow, and green indications suffer the most due being mounted above the roadway and within direct sight of the breaking, ocean waves. Because of the corrosive damage occurring to the signal heads, electronic technicians had to replace them once every three years. In addition the constant and sometimes high winds would cause the tunnel visors to blow off the signal heads. It was because of this continuous chore and associated costs that it was decided to try a signal head made from a different material. After some research, the solution was to replace the standard signal head made of painted aluminum with another made of UV stabilized polycarbonate plastic. The polycarbonate plastic material is colored yellow so there is no paint to flake off. Due to the relative lightweight nature of polycarbonate heads, the use of polycarbonate signal heads was limited to a rigid mount on a metal mast arm. Span wire applications were avoided because the wind would blow the signal heads out of position and tear them apart.	Operations Division 1	2005	Madison Phillips	(252) 482-7977.	Dollar Savings
Swivel Winch	There are five main problems associated with the daily task of the removal of debris and dead animals from the roadway: 1. Two or more employees are needed to remove large animals, 2. The handling of carcasses which have begun to decay or been mangled by vehicles, 3. Retrieval and removal of animals down steep slopes or across ditches, 4. Raising large animals into the back of dump trucks to be taken to disposal sites, and 5. Having enough shoulder to allow the truck to get off the road during loading. There was a need for a device that would enable a single employee to perform this task in a safe and timely manner. The solution was the development of the truck mounted swivel winch. The winch is mounted in the back corner of a pickup truck and utilizes a cantilever type structure which aids in the lifting action needed to raise a large animal into the truck. The supported weight is then swiveled into the bed of the truck by means of a flange bearing. The winch is equipped with 250 feet of cable and the sling is made of a 24-inch wide cold feed belt.	Operations-Division 1	2005	Retha Leigh	(252) 797-4598.	Safety Improvement
Window Tinting	The Ahoskie District Office Building has historically suffered from inadequate HVAC, specifically, air conditioning. Temperatures in offices located on the south side of the building often reached 80 degrees during time of bright sun. The problem existed regardless of the air temperature outside. In an effort to improve work conditions within the office, revisions to the existing HVAC were investigated. The costs of the necessary modifications approached $50,000. Given the unavailability of funds, other options were considered. The most economical solution found was theapplication of window tinting in the affected offices. Contacts were made with local vendors, but none could provide the necessarymaterials.A search of the Internet yielded a wholesale company that could provide material at a very reasonable price. The necessary paperwork was completed and the material shipped. A member of the District Office Staff then installed the tinting.	OPERATIONS - DIVISION 1	2002	C. W. Bridgers	(252) 482-7977	Communications
Pile Jetting Spoil Cleanup	The Manteo Resident Engineer's Office was faced with a challenge to develop a method of cleanup for spoils generated during the installation of piling in sensitive wetlands for the new Croatan Sound Bridge Project. Rather than relying on the contractor to solve this problem, a NCDOT team was developed to take ownership of research innovative methods, and select the course of action. A method of conveying the material approximately 1900 foot to high land was identified during a search of methods utilized by other industries. The shipbuilding and roofing industry utilize industrial vacuums to convey materials. The team made a visit to a shipyard in Virginia where the technology was working. An onsite demonstration was performed to insure conveyance of similar material over the required distance. The test was successful. Department personnel presented a video of the cleanup method to the Environmental Agencies. They approved this method of cleanup as their preferred method.	OPERATIONS DIVISION 1	2001	Randy Midgett	(252) 473-3637	Dollar Savings

Recycle Power Poles	The Williamston Bypass construction project of US 64 crossed a baseball field previously owned by the Town of Williamston. The right of way acquisition made the Department the owner of the field and all appurtenances. This included 13 power poles. While arranging for disposal of the transformers, a representative of NC Power indicated the Williamston Fire Department was in need of poles for a training facility. We contacted Jim Peele, Captain of the Fire Department, who confirmed they were interested. Captain Peele has agreed to remove the poles at no cost to the Department. An estimate for removal and disposal was requested from Barnhill Contracting Co., prime contractor on the above project. The quote received was as follows: 4 small poles @ $450/ea. = $1800 9 tall poles @ $1000/ea. = $9000 Therefore, the total cost to the Department would have been $10,800.	OPERATIONS DIVISION 1	2001	C. W. Bridgers	(252) 792-0347	Environmental Sustainability
Lowboy Trailer	disconnected from a truck. At times the truck could be 100 feet or more away from the trailer when unloading. This is very dangerous at night or in times of low visibility. The Division 1 Equipment team installed strobe lights in the rear taillights that work off of a battery mounted on the trailer. There is a toggle switch on the rear of the trailer that operates these lights. The battery is wired into the lights with a diode in line to keep the battery charged. The strobe lights can also be used when moving equipment to make the trailer more visible.	OPERATIONS DIVISION 1	2001	Ricky Feher	(252) 426-5738	Safety Improvement